Kentucky Lock
Gateway to the Ohio

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Welcome to Kentucky Lock, the Gateway to the Ohio on the Tennessee River.

Kentucky Lock is maintained and operated by the Nashville District, U.S. Army Corps of Engineers.

This presentation has five parts:

1) Update on traffic levels

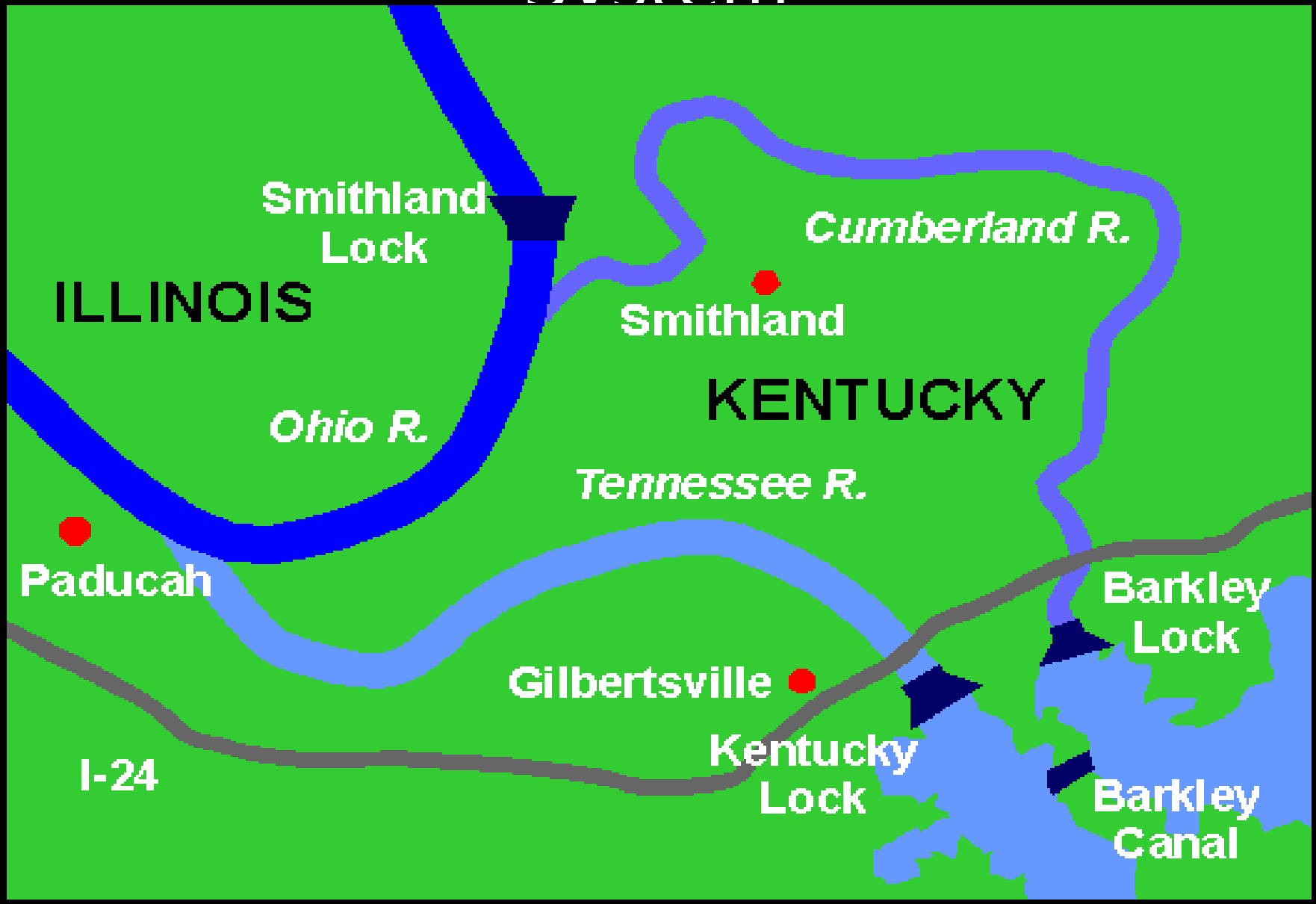
2) Description of the new lock and the history of its development

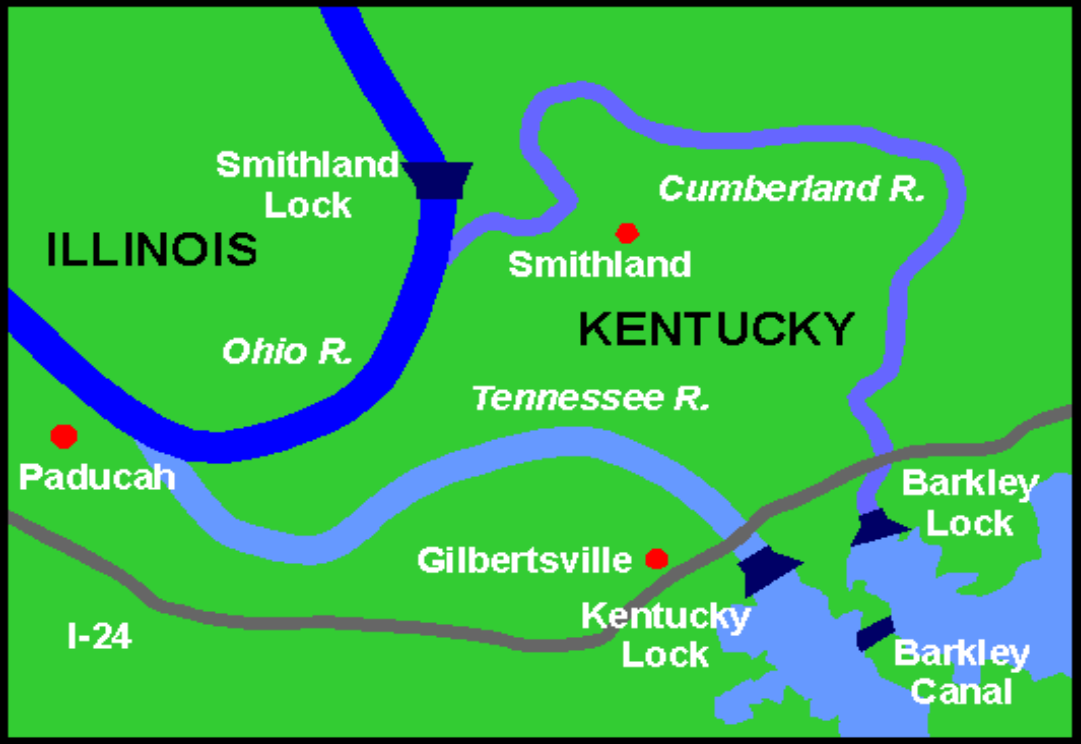
3) Nashville District's accomplishments in Fiscal Year 1998

4) Plans for Fiscal Year 1999

5) Schedule for lock construction and impact on shipping.

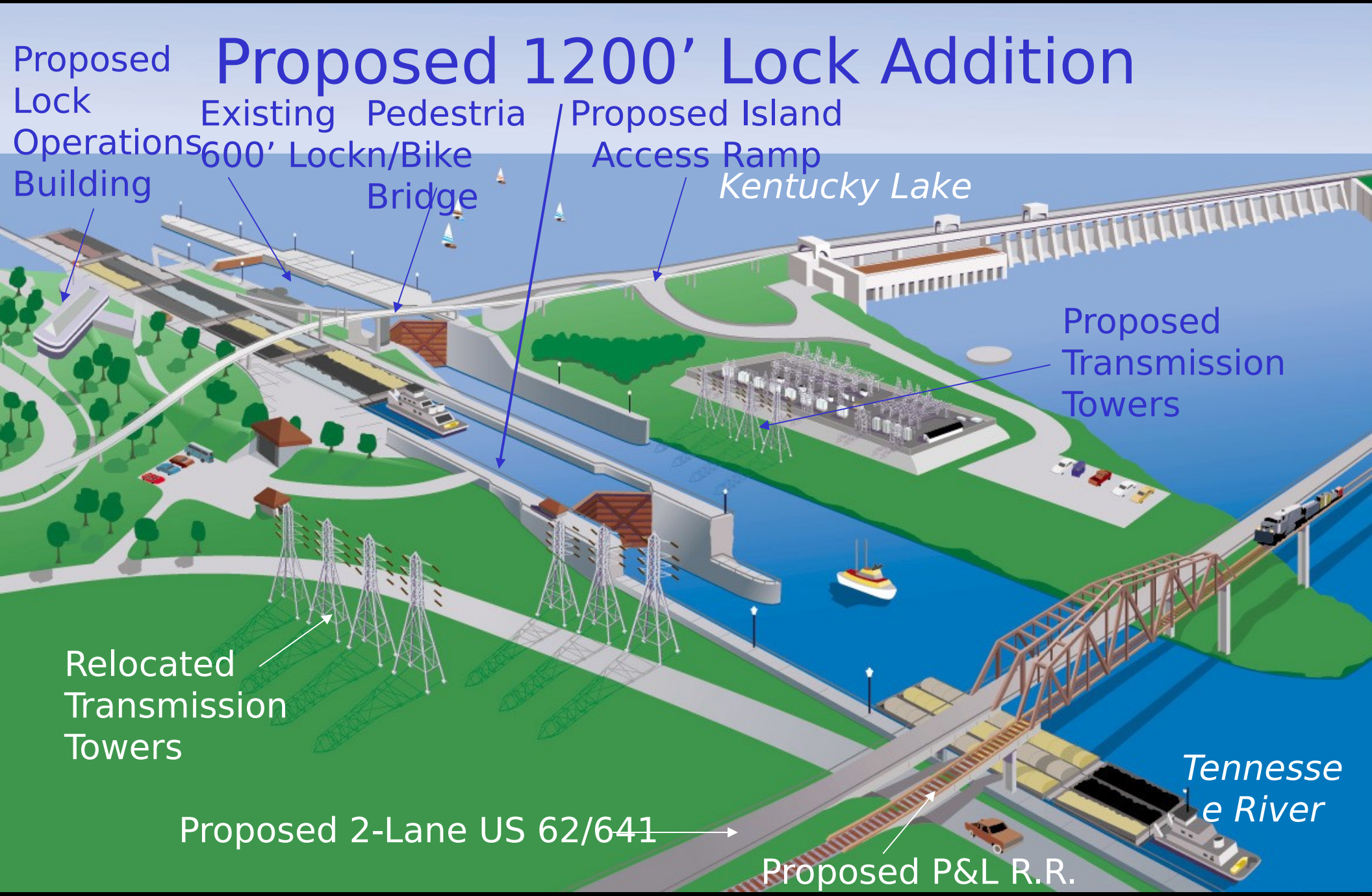
Kentucky/Barkley Navigation System



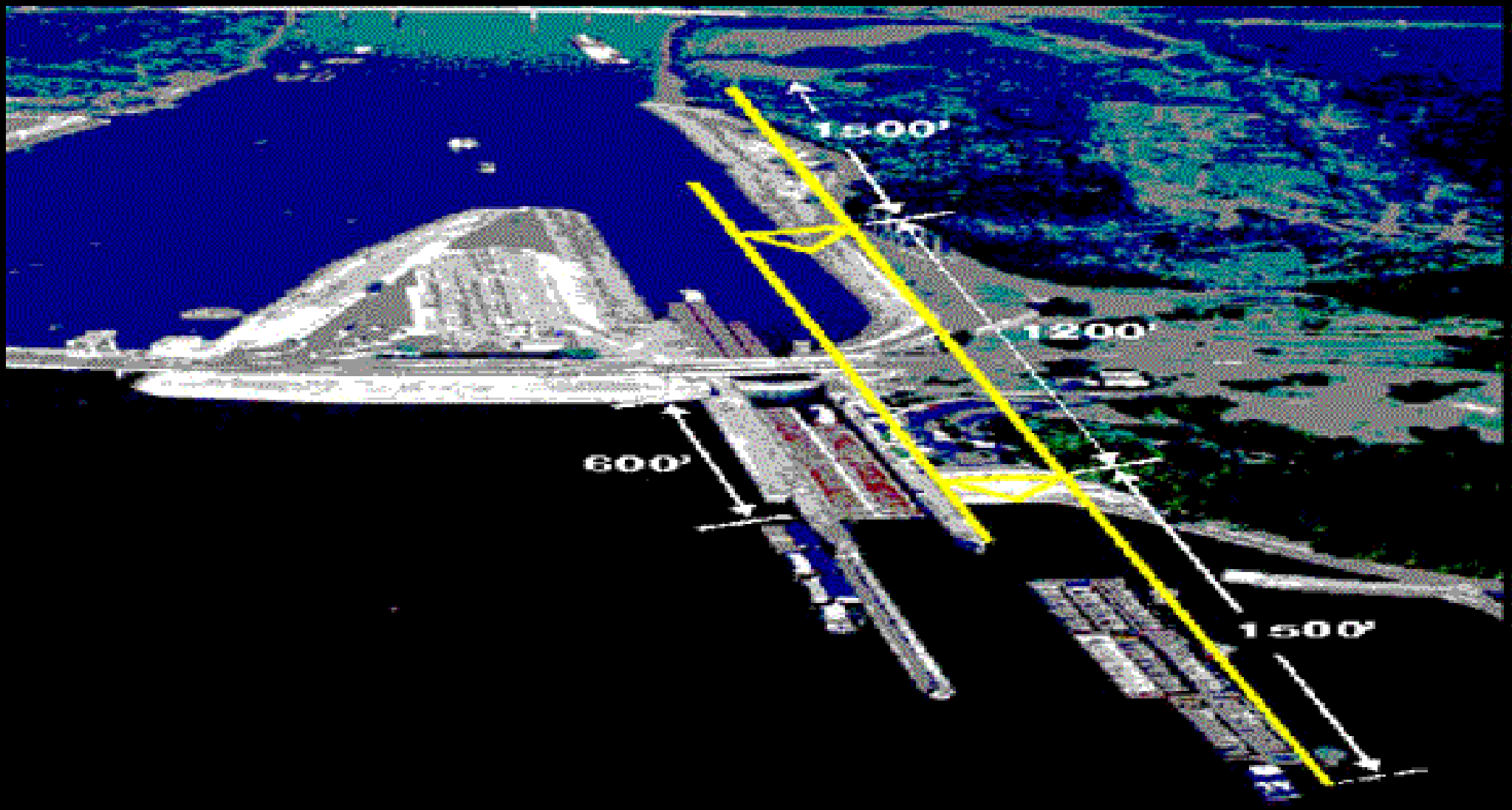


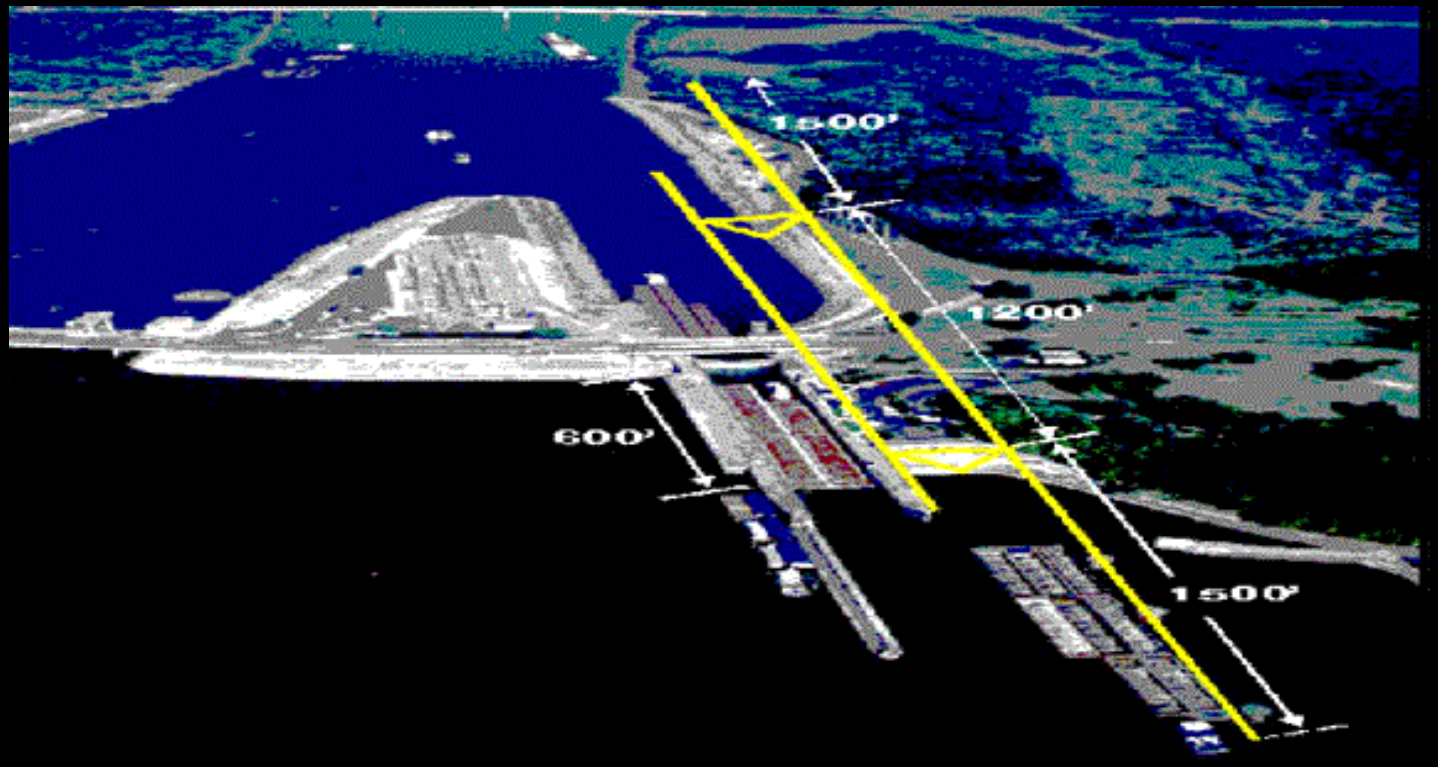
This map shows the Kentucky and Barkley locks to emphasize how much these two locks work as a system.

Their waterways are connected both upstream and downstream of the Dams. While the lower Cumberland River presents navigational problems, the actual and anticipated traffic at Barkley Lock is a factor in any analysis for the new lock at Kentucky.


Proposed 1200’ Lock Addition
Proposed Lock Operations Building
Existing 600’ Lock
Pedestria n/Bike Bridge
Proposed Island Access Ramp
Kentucky Lake
Proposed Transmission Towers
Relocated Transmission Towers
Proposed 2-Lane US 62/641
Proposed P&L R.R.
Tennesse e River

New Lock Placement



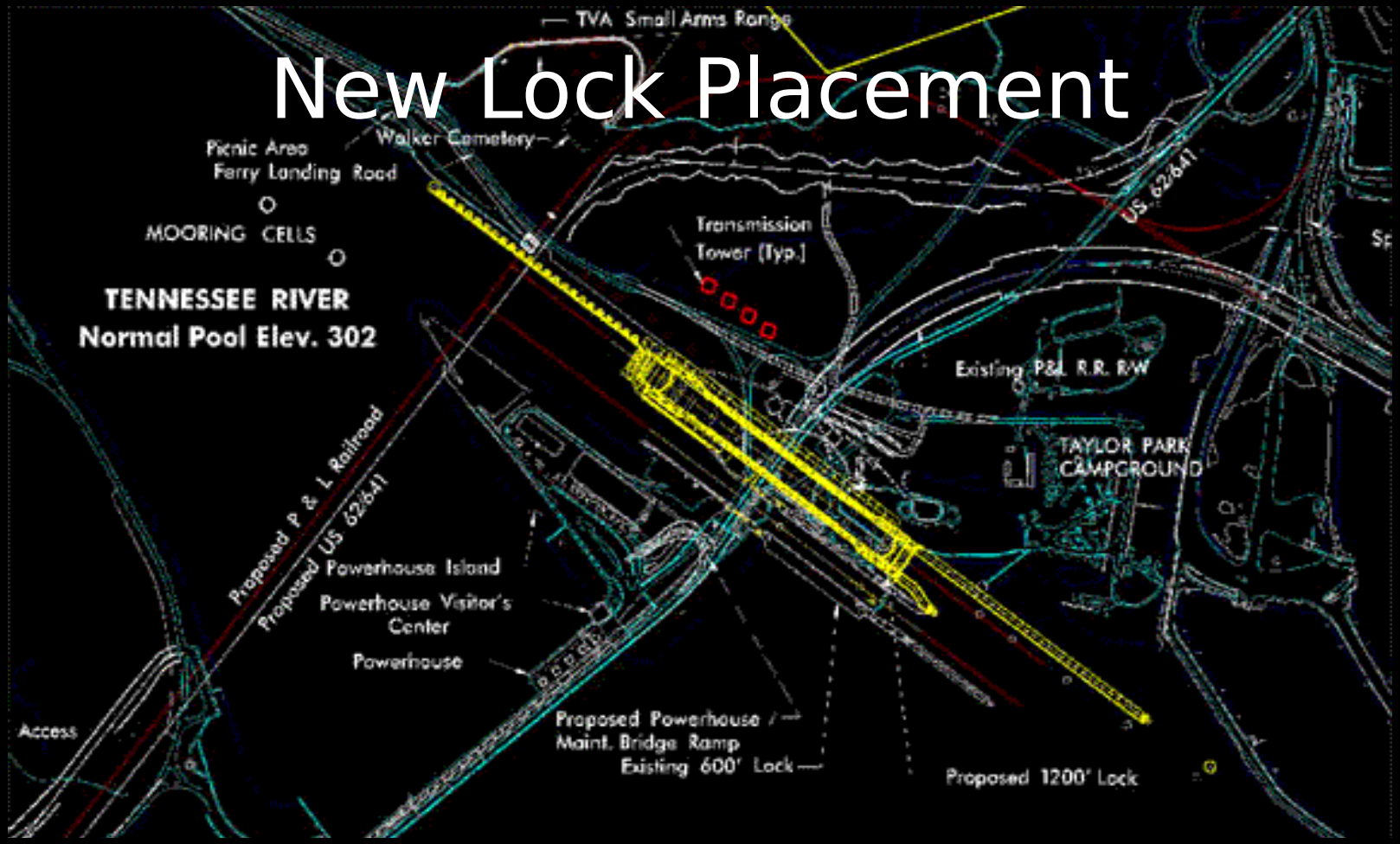


The new lock’s upstream miter gates will be about 100 feet downstream of the existing lock’s upstream miter gates, so much of the new lock will extend downstream of the existing lock.

Relocations

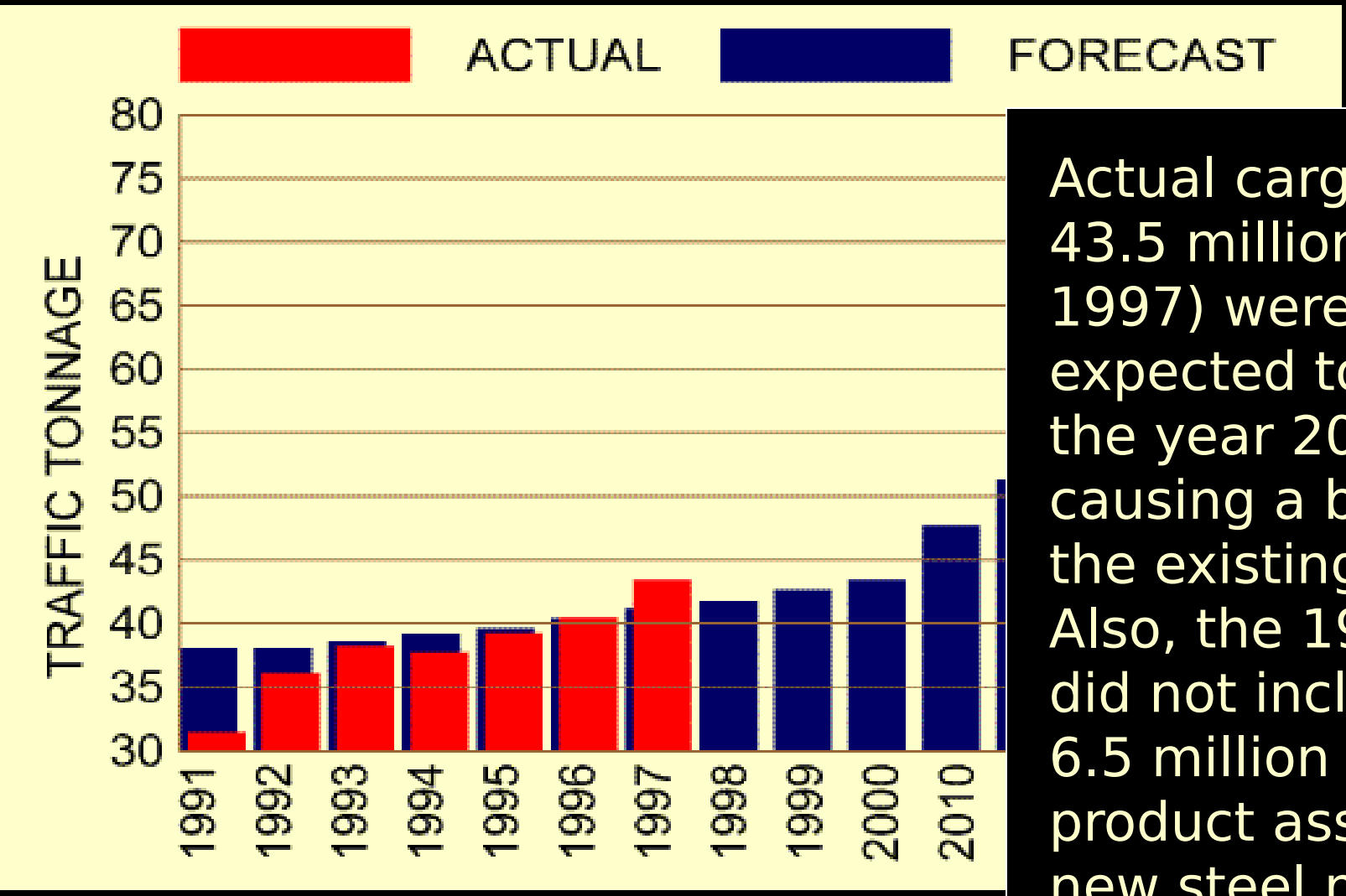
There are three major relocations that are a significant part of the total project cost. The first two are Highway 62 and the P&L Railroad which currently cross the lock and dam.
The current plan is to relocate them to a new bridge downstream of the dam.
This is a change from the 1992 Feasibility Report which proposed closing Hwy 62 for a period of at least 4.5 years during lock construction, then reopening it on its existing alignment.

New Lock Placement



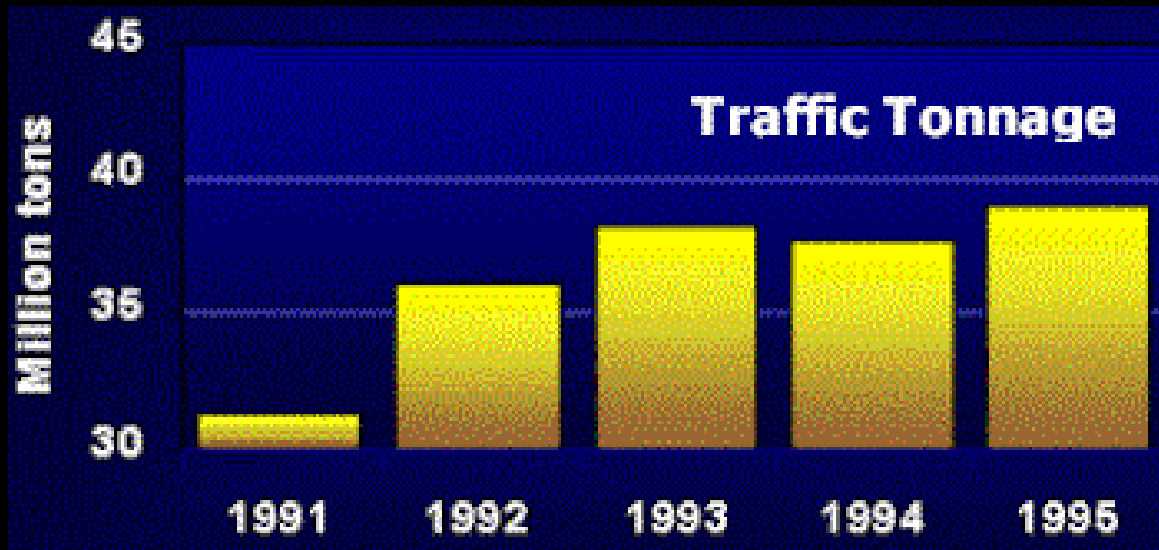
The third major relocation involves the seven large TVA transmission towers just downstream from the lock. In 1992, planners proposed relocating all seven towers, but because of design changes, the revised plan is to relocate just the four upstream towers.

KY-BAR Lock System Traffic Comparison

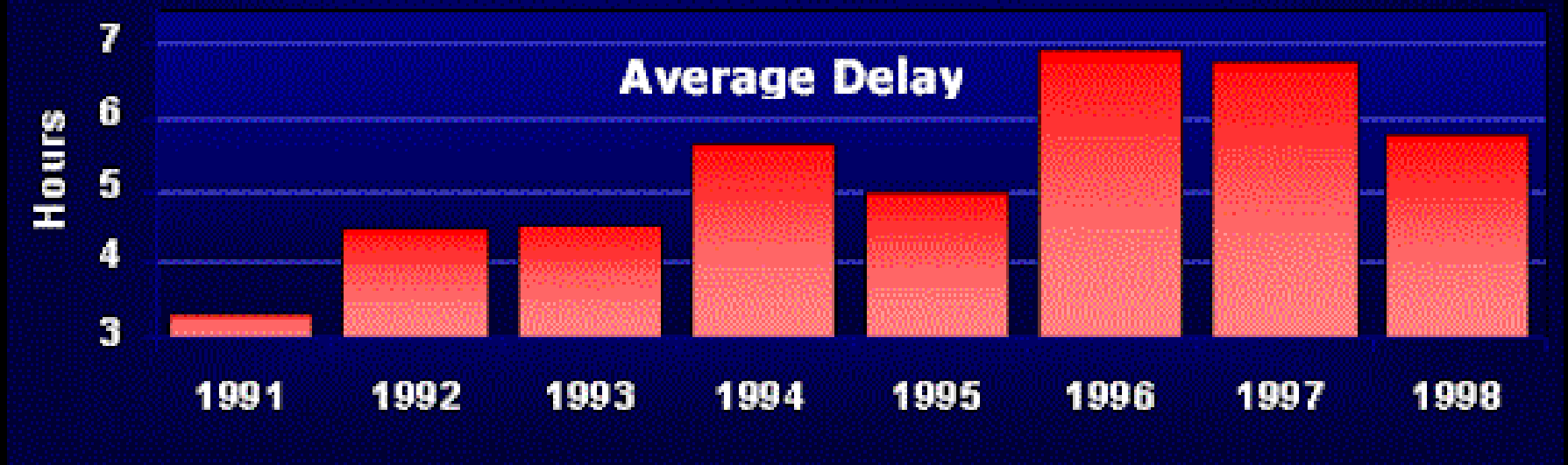


Actual cargo levels of 43.5 million tons (in 1997) were not expected to occur until the year 2000. This is causing a bottleneck at the existing lock. Also, the 1995 forecast did not include about 6.5 million tons of product associated with new steel mills in the

KY-BAR Lock System Traffic Comparison



Delay times have steadily increased from a little over three hours in 1991 to more than 6.5 hours in 1997



KY Lock Economics

- Cost - $533 M
- Benefit/Cost ratio of 2:5
- Forecast: Traffic levels are probably going to increase and costs may decrease so B:C will probably increase

KY Lock Economics

- Since 1995, engineers have refined the design in four major areas that will result in significant cost savings
- These include the selection of a through-sill intake system and an interlaced lateral discharge system, the use of roller compacted concrete in the lock walls, and constructing the downstream guidewall "in the wet" versus constructing a cofferdam around it as proposed in the 1992 Feasibility Study.

Lock Model

This photo was taken from the downstream side.
The length of the lock model's chamber is about 50 feet. The existing lock's chamber is not included in the model but its upstream and downstream approaches are included. What you see is the new downstream guardwall and the interlaced

Lock Model Coordination

- The lock model has proven a valuable tool for engineers as well as a vehicle to involve the navigation industry in the design process.
- In July 1997, representatives from the navigation industry were invited to WES to view the model and provide input to the design.
- Important design changes include selecting the interlaced lateral discharge system over a more expensive “land-side channel” system allowing tows to moor to the downstream guidewall during a lock discharge under most conditions - similar to how the existing lock operates.
- Other changes that came out of that meeting were to the upstream and downstream guardwalls; a floating pontoon section for the upstream guardwall is being planned. A decision was also made to shorten the upstream guidewall.

FY 98 Activities ($4M)

- Construction on Kentucky Lock began in August last year with a $4 million dollar appropriation.
- Nashville District spent about $250 thousand dollars to begin the process of relocating the large TVA transmission towers.
- An access road on the powerhouse island was built - necessary to construct a large “pull-off” structure.
- The downstream guardwall agreed upon at WES was redesigned and testing of the lock model was completed.
- Design of the upstream, floating guardwall was completed and tested in the lock model last fall.

FY 98 Activities ($4M) cont.

- Engineers are working on a new project cost estimate, to include all of the changes that have occurred since the 1995 Tier II report. These include the intake system, the discharge system, upstream and downstream guidewalls and guardwalls, roller compacted concrete in the lock walls, and the downstream highway bridge. Planners are also continuing to design the lock. There is an extensive geo-technical exploration program underway - about 80 holes were drilled last year.

Anticipated FY 98 Activities

- The model will also help to determine the length of the downstream guidewall and the location of the first pair of mooring cells.
- A draft scope of work for the model was sent to the Navigation Industry for their input.
- Engineers at the Nashville District are interested in what navigation customers think of the draft.

Anticipated FY 98 Activities (cont.)

- Continued construction on relocation of TVA transmission towers
- Continued design of lock, RR and Hwy bridges, and cofferdams

Future Milestones Based on Fast-track Schedule

- Schedule based on unconstrained funding. Lower funding levels will lengthen completion date
- 2001 Complete Transmission Towers. Start construction of cofferdams, RR and Hwy bridges
- 2002 Start Lock Construction
- 2008 Project Construction Complete
  - The milestones shown in this slide are for a schedule that assumes an aggressive funding level each year. With high funding levels, the new lock could be completed by 2008. With less aggressive funding levels, the lock's completion will be pushed out according to the actual funding levels received.

KY Lock Construction Delay Impacts

- Cost of Delay to Industry
  $1.04 Billion if delayed from 2008 to 2018
  - Based on Dec. ‘95 forecast

Construction Impacts to Navigation

- RR and Highway bridges will be clear spans across the lock canal
  - Constructed off-site and floated in-place
- Construction of D/S cofferdam
  - Close Kentucky Lock for a total of about 90 days. This non-continuous closure will be closely coordinated with shippers

Construction Impacts to Navigation

- Engineers guess that construction of this cofferdam will close the lock to navigation for a total of about 180 days. Planners don’t expect this to be a continuous closure, possibly only two weeks at a time, and they will try to schedule it so that it minimizes the impact to shippers.
- Efforts are being made to shorten this impact period. Engineers plan to investigate two means to lessen or eliminate these closures.
- One method is to incorporate the downstream cofferdam into the middle lock wall; thus mooring it away from the current navigation channel.
- The second method under consideration is to float-in of some of the middle lock wall sections, eliminating the need for the section of cofferdam affecting existing navigation patterns.

The Nashville District appreciates your interest in Kentucky Lock.

Make plans now to attend the groundbreaking ceremonies for

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